

CLAIMS:

1. An apparatus for air-cooling and tempering a glass sheet, comprising:

5 a conveying means installed to be operable from a forming zone to a cooling area and to convey a glass sheet in a high temperature state,

a plurality of upper blowing members provided in parallel along a conveying direction of glass sheet above the conveying means in the cooling area,

10 a plurality of lower blowing members provided in parallel along a conveying direction of glass sheet under the conveying means in the cooling area,

a plurality of air-supply boxes provided in each of the upper and lower blowing members for controlling
15 blow/stop operations of cooling air from each of the blowing members, and

an air-supply source connected to these air-supply boxes,

wherein each of the air-supply boxes comprises a
20 cylindrical damper having a perforated hole provided at its side, a casing for rotatably accommodating the damper and for forming an air channel only when the damper is at a predetermined rotational position, and a slide bearing provided in a space between the damper and the casing,

25 wherein the cooling air supplied from the air-supply source can be supplied to the upper and/or lower blowing members through air channels by adjusting the rotational

position of the damper.

2. The apparatus for air-cooling and tempering a glass sheet according to Claim 1, further comprising a control means for controlling the rotational position of a damper
5 so that it

(a) stops cooling air to be blown from all of the upper and lower blowing members in the cooling area in the initial state,

(b) blows the cooling air from all of the upper and lower
10 blowing members when the substantially whole of a conveyed glass sheet is entered in the cooling area, and
(c) sequentially stops the cooling air blown from the upper and lower blowing members located behind the glass sheet in response to the conveyance position of the glass
15 sheet after the last glass sheet in the cooling area is passed.

3. The apparatus for air-cooling and tempering a glass sheet according to Claim 1 or 2, wherein an upper and/or lower blowing member comprises an air-nozzle swingable in
20 the conveying direction of glass sheet.

4. The apparatus for air-cooling and tempering a glass sheet according to Claims 1 to 3, wherein the conveying means is a conveyor comprising a plurality of rollers disposed in parallel along the conveying direction of
25 glass sheet.

5. The apparatus for air-cooling and tempering a glass sheet according to Claim 4, wherein the rollers move up

and down according to the position of a glass sheet so that a curved glass sheet can be conveyed.

6. The apparatus for air-cooling and tempering a glass sheet according to any one of Claims 1 to 5, wherein a
5 plurality of dampers are connected via an Oldham's coupling.

7. The apparatus for air-cooling and tempering a glass sheet according to any one of Claims 1 to 6, wherein the glass sheet is for a window glass of automobiles.

10 8. In a process for air-cooling and tempering a glass sheet comprising employing an apparatus for air-cooling and tempering a glass sheet, the apparatus comprising a conveying means installed to be operable from a forming zone to a cooling area and to convey a glass sheet in a
15 high temperature state, a plurality of upper blowing members provided in parallel along a conveying direction of glass sheet above the conveying means in the cooling area, a plurality of lower blowing members provided in parallel along a conveying direction of glass sheet under
20 the conveying means in the cooling area, a plurality of air-supply boxes provided in each of the upper and lower blowing members so as to control blow/stop of cooling-air from each of the blowing members, and an air-supply source connected to these air-supply boxes, the process
25 being characterized by comprising:

(a) a step of stopping cooling air from all of the upper and lower blowing members in the cooling area in the

initial state,

(b) a step of blowing the cooling air from all of the upper and lower blowing members when the substantially whole of a conveyed glass sheet is entered in the cooling
5 area, and

(c) a step of sequentially stop the cooling air blown from the upper and lower blowing members located behind the glass sheet in response to the conveyance position of the glass sheet after the last glass sheet in the cooling
10 area is passed.

9. The process for air-cooling and tempering a glass sheet according to Claim 8, wherein an upper and/or lower blowing member comprises an air-nozzle swingable in the conveying direction of glass sheet.

15 10. The process for air-cooling and tempering a glass sheet according to Claim 8 or 9, wherein the conveying means is a conveyer comprising a plurality of rollers disposed along the conveying direction of glass sheets.

11. The process for air-cooling and tempering a glass
20 sheet according to Claim 10, wherein the rollers move up and down according to the position of the glass sheet so that a curved glass sheet can be conveyed.

12. The process for air-cooling and tempering a glass sheet according to any one of Claims 8 to 11, wherein a
25 plurality of dampers are connected via an Oldham's coupling.

13. The apparatus for air-cooling and tempering a glass

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sheet according to any one of Claims 8 to 12, wherein the glass sheet is for a window glass of automobiles.